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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,803	06/28/2001	Bharath Rangarajan	F0660	7099

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EXAMINER	
ROSENBERGER, RICHARD A	
ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 09/893,803	**Applicant(s)** RANGARAJAN ET AL.	
	Examiner Richard A. Rosenberger	**Art Unit** 2877	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 21 June 2005 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☐ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☒ The Notice of Appeal was filed on *21 June 2005*. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: see attached.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☐ Other: _____.

1. On page 3 of the remarks 6/21/2005 it is asserted that "the Examiner asserts that both the concepts and advantages of employing scatterometry to measure multi-slope semiconductor features is well known and expected in the art" and misstates the grounds of the rejection by suggesting that these are "well-known statements", or takings of official notice, of the sort discussed in MPEP 2144.03. But this portion of the final rejection is *not* a taking of official notice, but an explicit reliance on the accuracy of statements made by Applicants and their representative as to what is known in the prior art, statements in both the instant specification and in the record, in particular in the paper filed 6/8/2004. Thus these particular remarks, as they misstate the grounds of the rejection, do not, and cannot, serve to advance prosecution.

2. As noted in the rejection 1/2/2004, the instant specification does not, and does not purport to, teach those in the art how to make and use scatterometry to measure multi-slope semiconductor features, nor how to etch multi-slope features. The specification merely notes that "[s]catterometry systems are well known in the art, and therefore further discussion related thereto is limited for the sake of brevity" [specification, page 12, lines 14-16] and "[t]he manner in which processor 814 can be programmed to carry out the functions relating to the present invention will be readily apparent to those having ordinary skill in the art based on the description provided herein" [page 12, lines 18-21]. Similarly for the apparatus and techniques for performing multi-slope etching: "[s]uch etching components are known in the art, and thus discussion thereof is limited herein for the sake of brevity" [page 3, lines20-21], and "[t]echniques for fabricating features with such angles are known in the art" [page 9, lines 2-3]. The specification offers no objective evidence that these characterizations of what is known in

the art is in fact correct; the specification does not point to any place where those in the art can go to find this information. The specification presents these statements as to what is known in the art as nothing more than unsupported allegations.

Further Applicants (or Applicants' representative) in the remarks filed 6/8/2004, also stated that "the prior characterization of scatterometry and the process for generating multi-slope features and devices as two distinct and separate processes as being well known in the art is correct, and as such is noted in the specification" (remarks filed 6/8/2004, page 12, lines 2-4). As with the statements in the specification, these are unsupported allegations; the remarks, while alleging this material is well-known, do not point to any place where those in the art can find this material, or provide any other objective evidence that the material is in fact well-known.

It is of course correct that patent law does not require more if the allegations are in fact accurate. Applicants do not have to provide details of material which is genuinely well-known in the art, and do not have to explicitly point to where to find material which is sufficiently well-known in the art that those in the art can be expected to know or to be otherwise able to readily find. This does not, of course, relieve applicants of the requirement under 35 USC 112, first paragraph, to provide disclosure sufficient to enable those in the art to make and use the invention.

As the record shows, the examiner has generally taken, and is now taking, these and similar statements at face value, accepting as accurate the statements in the specification and elsewhere in the record that etching multi-slope features and measuring multi-slope features are so well known in the art that the sort of unsupported allegations found in the specification and various remarks is sufficient for adequate disclosure. Note the office actions of 12/3/2002 and

5/15/2003 clearly take the characterization in the specification of the content of the prior art as being accurate; and the office action of 9/10/2004, in withdrawing a rejection, depends on the statements in the record, in the remarks filed 6/8/2004, that this material is in fact that well-known.

The most recent set of remarks; those filed 6/21/2005, takes these statements which Applicants and Applicants' representative have made on the record, and are being relied upon for completeness of disclosure, and "requests that the Examiner cite a reference in support of his position" [remarks filed 6/21/2005, page 3, line 30]. The "reference" being relied upon in the rejection is, of course, Applicants', and Applicants' representative's, clear statements on the record that this material is well-known. Thus the "request" in the remarks is the rather bizarre request that the Examiner prove to Applicants and their representative that they themselves were making accurate the statements on the record when they alleged that this material is so well-known that the mere mention of it, without any objective evidence whatsoever, is sufficient disclosure to enable those in the art to make and use the disclosed invention.

Thus this "request", besides misstating the grounds of the rejection by the incorrect allegation that an explicit reliance upon the accuracy of statements made by Applicants and their representative is nothing more than a taking of official notice, is also so inconsistent with Applicants', and Applicants' representative's, statements on the record that it at least approaches a repudiation the those statements; a "request" that the Examiner prove to Applicants and their representative that they were making accurate statements on the record at least suggests that Applicants and their representative is unwilling, at this time at any rate, affirm these statements; perhaps, for example, they have become aware since the statements were made that they are not

correct. Thus this "request" suggests the rejection under 35 USC 112, first paragraph (made in the office action mailed 1/2/2004; withdrawn on the basis of reliance on the accuracy of statements on the record in the office action mailed 9/10/2004) was withdrawn in error. If these statements on the record by Applicants and their representative are so unreliable that the Examiner must prove them, then they are necessarily so unreliable that they cannot be used to support the disclosure, and the rejection under 35 USC 112, first paragraph, previously withdrawn on the belief that these statements were reliable, must be reinstated.

3. The remarks allege, on page 3, first full paragraph, lines 6-18, that Moslehi does not show "the *in-situ* use of an optical measuring device for process control in processing tools such as etch processes" [lines 8-9] and that "nowhere does the cited document [i.e. Moslehi] teach or suggest *in-situ* regulation of an etch process" [lines 13-14]. This is not correct. The Moslehi reference is replete with references to process control. See, for example, the abstract, last five lines: "a process control computer ... yielding ... control signals"; column 6, lines 31-33: "the non-invasive in-situ sensors 20 are the most suitable type for device fabrication process control needs"; column 6, lines 39-42: "the in-situ sensors 20 are designed for real-time ... process control". See also figure 1, which shows *in situ* measurements (box 20) being designed for real-time (box 26) including process control applications such as feedback control (box 30).

Note further that the section of the Moslehi reference, column 8, lines 20-27, referred to in the remarks (remarks, page 3, lines 10-12) is part of a discussion of figures 3a and 3b of that reference (column 8, line 20 of the reference refers explicitly to those figures). The broader discussion of those figures of which this is a part begins on column 7, line 61, the first sentence

of which is "Fig. 3 illustrates various single-wafer and their associated 'critical' *in-situ process control* sensors" [emphasis added]. Note the explicit reference not only to *in-situ* measurements, but to *process control* as well. The "Brief Description" of figures 3a and 3b, found on column 4, lines 42-44, notes that these figures are "charts describing useful *in-situ sensors for process control* in various semiconductor device fabrication processes" [emphasis added]. Again, note the explicit disclosure of not only *in-situ* sensors, but of their use for process control.

Thus, far from it being the case that "nowhere does the cited reference teach or suggest *in situ* regulation of an etch process" (remarks, page 3, lines 13-14), such *in situ* regulation of a fabrication process is most fairly understood as part of the very intent and purpose underlying the disclosure therein, and the reference clearly includes, and clearly intends to include, etch processes within the fabrication processes with which such *in situ* measurement and regulation is useful.

4. The remarks allege (page 3, lines 14-17) that "the reference [i.e., Moslehi] is silent with regard to the claimed limitation of *in situ regulation of an etch process ... comprising one or more etching components operative to etch at least one aspect of a multi-sloped feature on a wafer and an etch component controller for controlling the one or more etching components*" [emphasis in original]. This allegation seems to be correct, although irrelevant. The reference, it is true, does not by itself explicitly teach that the etch processes mentioned include the etching of a *multi-sloped* feature (although, of course, there is nothing in the reference to suggest that there was any intention to *exclude* such etching). Thus it is also true that the reference cannot properly applied by itself as a sole reference under 35 USC 102. However, the rejection is in no manner

based upon any allegation or belief that it does explicitly mention etching *multi-sloped* features (as opposed to other types of features), and it is not being applied as if it did under 35 USC 102. So this observation in the remarks, however true it may be, is not relevant to the prosecution of this application.

5. The remarks, on page 4, lines 5-7, suggests that "neither the nature of the problem to be solved, the teachings of the prior art, nor the knowledge of persons of ordinary skill provides sufficient suggestion or motivation to combine the references". This is not correct.

Here the prior art does explicitly provide the motivation for the combination of the rejection. Moslehi, for example, recognizes the problem: "Deviations from specified target tolerances in excess of only a few percentage points may result in defective and rejected semiconductor chips" [column 1, lines 37-39] and "Semiconductor device manufacturers can only discard rejected semiconductor chips, thus resulting in undesirable production process waste and increased device manufacturing costs" [column1 , lines 40-43]. Moslehi also teaches the general claimed solution: "If it is possible, however, to closely monitor various process and wafer parameters in situ during or immediately after processing each individual wafer, equipment and process inputs may be properly adjusted to reduce process parameter spread" [column 1, line 43-47]; see also many other statement in that reference disclosing the use of *in situ* measurement for process control, some of which are enumerated above. This is the solution of the instant invention as claimed, to use *in situ* measurements for process control (or "regulation") Thus the teachings in the cited art, in at least the Moslehi reference, clearly do provide sufficient suggestion or motivation for the combination.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger
29 June 2005.

Richard A. Rosenberger
Primary Examiner